

## PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION.



### An Improved Process and Apparatus for the Cleaning or like Treatment of Fish.

We, GEOFFREY ROBERT ST. JOHN, of Nunnington, Oakdale Road, Tunbridge Wells, Kent, a British Subject, and STANLEY BIRD, of Wyndham Court, 1, Hallam Street, London, W.1, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to an improved process for the treatment of fish more especially intended to be applied to freshly caught fish either in fishing vessels whilst at set or immediately upon the catch being landed.

According to this invention the fish as taken from the sea or after being gutted in the usual manner are placed in perforated boxes which are alternately immersed in and lifted out of water in a tank. The water which, for example, may be sea water or fresh water to which salt has been added flowing into and out of the boxes cleans the fish therein which are only loosely packed or do not entirely fill the box so that the fish are alternately immersed and drained, and the water can exercise a scouring action thereon. The fish are also chilled by immersion in the cold liquid. Water from the tank in which the boxes are immersed is continuously withdrawn and passed through a suitable filter from which it is returned to the tank. The liquid being continuously pumped from the tank through the filter, slime, scales and other matter are removed and at or towards the end of the process clean fish are being washed in clean water, free from matter in suspension.

In some instances it is preferable to add sodium hypochlorite to the sea water or fresh water in the tank, or sea water may be subjected to an electrolytic action by passing a current of electricity therethrough between suitable electrodes immersed in sea water in a separate reservoir from whence it is poured into the tank.

Fish which have been thus treated after removal from the perforated boxes may be placed upon trays which from time to time, as may be required, are sprayed with water drawn from the pipe by which water is carried away from

the filter to the tank. The fish is thus kept moistened and washed by water in the same condition as that returned to the tank after passing through the filter. The sodium hypochlorite combined with the sea water has a powerful oxidising and sterilising effect.

In a convenient arrangement of apparatus for carrying out the process in accordance with this invention, the perforated boxes are formed by partitions in a rotary drum, or are made separately and removably held in compartments in the drum which dips into the liquid in the tank so that the boxes can be continuously carried down into the liquid and raised therefrom. The axle or shaft of the drum extends outside the tank so that a rotary motion can be conveniently imparted thereto, the bearing or aperture through which the axle or shaft passes to the exterior being packed to prevent leakage. The tank and the rotary drum as well as the filter and pipe connections are preferably made of a non-corrosive metal or protected by a suitable anti-corrosive coating or lining to withstand the effects of the washing liquid. The separate boxes and the trays can be made of wood or non-corrosive or other suitable metal, and may be divided by partitions or shelves into smaller compartments of a convenient size.

When this apparatus is installed for example, in a vessel, the tank is provided with doors at a convenient height, so that, by stopping its movement, the fish or boxes in which the fish have been placed, can be loaded into or removed therefrom through these doors. Thus boxes or trays carrying the fish can be loaded on to the drum through a deck door and after treatment for a sufficient length of time, each box can be removed in close proximity to the fish store room, the discharge of the fish on arrival in port being effected by lifting them to deck level by means of the rotary drum used as an elevator.

In an alternative construction a tank is provided having extended upwardly therefrom a well in which endless chains are arranged carrying a number of per-

-forated boxes, the said chains passing round chain wheels by which motion can be imparted to the chains so that the boxes can be continuously carried down into the tank and raised therefrom.

The well is provided with doors at convenient heights, for example, at or above deck level and also above the level of the liquid in the tank so that, by stop-

ping the movement of the chains, boxes may be loaded thereon or removed therefrom through these doors.

Dated this 14th day of October, 1930.

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Agents for the Applicants.

## COMPLETE SPECIFICATION.

### An Improved Process and Apparatus for the Cleaning or like Treatment of Fish.

We, GEOFFREY ROBERT ST. JOHN, of Nunnington, Oakdale Road, Tunbridge Wells, Kent, a British Subject, and STANLEY BIRD, of Wyndham Court, 1, Hallam Street, London, W.1, a British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an improved process for the treatment of fish more especially intended to be applied to freshly caught fish either in fishing vessels whilst at sea or immediately upon the catch being landed.

It has previously been proposed to preserve fish by treating the same with chlorinated or electrolised water, a circulation of such water being maintained by means of a pump. It has further been proposed in order to clean fish from slime and other impurities to treat the same whilst held in a perforated container by alternately immersing the container in and lifting it out of water.

In accordance with this invention, a process for the treatment of fish consists in placing the fish in perforated boxes or trays through which is passed water which is subjected to an electrolytic action and contains a sterilising agent such as sodium hypochlorite, the trays being alternately immersed in and removed from the water, or a continuous stream of water being caused to flow through the trays.

The fish as taken from the sea or after being gutted in the usual manner are placed in perforated boxes which may be alternately immersed in and lifted out of a tank containing a solution of a sterilising agent in water, which for example, may be sea water or fresh water to which salt has been added. The solution flowing into and out of the boxes,

cleans the fish therein which are only loosely packed or do not entirely fill the box so that the fish are alternately immersed and drained, and the water can exercise a scouring action thereon. In some instances it is sufficient to establish or maintain a circulation of the water through the boxes, and this may be temporarily necessary in case the means for moving the boxes into and out of the water is out of operation. The fish are also chilled by immersion in the cold liquid. Water from the tank in which the boxes are immersed is continuously withdrawn and passed through a suitable filter from which it is returned to the tank. The liquid being continuously pumped from the tank through the filter, slime, scales and other matter are removed and at or towards the end of the process clean fish are being washed in clean water, free from matter in suspension.

Sodium hypochlorite or other suitable sterilising agent is added to the sea water or fresh water in the tank, and the water is subjected to an electrolytic action by passing a current of electricity therethrough between suitable electrodes immersed in sea water in a separate reservoir from whence it is poured into the tank, or immersed in the tank in which the fish are treated.

Fish which have been thus treated, after removal from the perforated boxes, may be placed upon trays which from time to time, as may be required, are sprayed with water drawn from the pipe by which water is carried away from the filter to the tank. The fish is thus kept moistened and washed by water in the same condition as that returned to the tank after passing through the filter. The sodium hypochlorite combined with the sea water has a powerful oxidising and sterilising effect.

A convenient arrangement of apparatus for carrying out the process in accordance with this invention is shown diagrammatically in the accompanying drawing.

5 As shown in this drawing *a* is a tank supplying water, such as sea water, to electrolysis tanks *b* in which the water is treated by an electric current generated by a dynamo *c* driven by an oil engine *d* 10 or other suitable motive power. The water after treatment in the tanks *b* is passed to a tank *e* through a pipe *e'*. If desired the admission of water to the tanks *b* and *e* can be controlled by valves 15 *f* so that the tanks *b* are charged and discharged alternately. By this means a continuous rate of supply of electrolysed water to the tank *e* can be maintained. In such an arrangement the valves *f* can 20 be connected to switches in the electric circuits from the dynamo to open or close the circuit supplying electric current through a cable *e'* to each tank in turn, as desired.

25 A box *g* in which the fish to be treated are placed can be alternately raised from and lowered into water in the tank *e* by supporting the box on endless chains *h* travelling round chain wheels *i* to which 30 movement is imparted in any convenient manner. The endless chains can be arranged to carry more than one box.

The upper part of the tank into which the box is lifted from the water is provided with a door *j* at a convenient 35 height, for example, at or above deck level, and other doors may also be provided at other parts of the tank so that by stopping the movement of the chains, 40 boxes may be loaded thereon or removed therefrom through these doors.

Water from the tank *e* is withdrawn by a pump *k* through a filter *l* and 45 returned through a pipe *m* to the said tank which can be provided with valve controlled overflow pipes *n* at different levels to carry away excess water entering from the tanks *b*. The tank *e*, the filter and the pump can be drained 50 through a pipe *o*.

Instead of suspending the perforated boxes on endless chains, these boxes, if preferred are formed by partitions in a 55 rotary drum, or are made separately and removably held in compartments in the drum which dips into the liquid in the tank so that the boxes can be continuously carried down into the liquid and raised therefrom. The axle or shaft of the drum 60 extends outside the tank so that a rotary motion can be conveniently imparted thereto, the bearing or aperture through which the axle or shaft passes to the exterior being packed to prevent leakage. The 65 tank and the rotary drum as well as the

filter and pipe connections are preferably made of a non-corrosive metal or protected by a suitable anti-corrosive coating or lining to withstand the effects of the washing liquid. The separate boxes 70 and the trays can be made of wood or non-corrosive or other suitable metal, and may be divided by partitions or shelves into smaller compartments of a convenient size.

When this apparatus is installed for 75 example, in a vessel, the tank is provided with doors at a convenient height, so that, by stopping the movement of the drum, the fish or boxes in which the fish have been placed, can be loaded into 80 or removed therefrom through these doors. Thus boxes or trays carrying the fish can be loaded on to the drum through a deck door and after treatment for a sufficient length of time, each box can 85 be removed in close proximity to the fish store room, the discharge of the fish on arrival in port being effected by lifting them to deck level by means of the rotary 90 drum used as an elevator.

Any other convenient method of moving the boxes in the tank can be employed to minimise the space within the tank occupied by the conveying means, or the 95 boxes can be placed in the tank and the latter alternately filled and emptied so that there is a flow of water into and out of the boxes, the water from the tank being filtered before being returned 100 thereto.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we 105 claim is:—

1. A process for the treatment of fish, wherein the fish are placed in perforated boxes or trays through which is passed 110 water which is subjected to an electrolytic action and contains a sterilising agent such as sodium hypochlorite, the trays being alternately immersed in and removed from the water, or a continuous stream of water being caused to flow 115 through the trays.

2. A process as claimed in Claim 1, wherein the water is contained in a tank and is continuously withdrawn from and returned to the tank through a filter.

3. A process as claimed in Claim 2, 120 wherein after treatment in the water in the tank, the fish are kept moist by water withdrawn from the tank through the filter.

4. A process for the treatment of fish 125 wherein the water substantially as hereinabove described.

Dated this 12th day of August, 1931.

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Agents for the Applicants.

Reference has been directed, in  
pursuance of Section 7, Sub-section 4  
of the Patents and Designs Acts 1907 to  
1928 to Specifications Nos. 173,285 and  
23,194/1914.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1932.

*[This Drawing is a reproduction of the Original on a reduced scale.]*

